REMARKS

By this Amendment, claims 1-10 are amended to clarify the recited subject matter. Claims 1-10 are pending.

Claims 1-10 were rejected under 35 U.S.C. 103(a) as been unpatentable over Kalker et al. (US Pub. 2004/0250079; hereafter "Kalker") in view of Haitsma et al. (US 6,477,431; hereafter "Haitsma"). Applicant traverses the rejection because the cited prior art, analyzed individually or in combination, fails to teach or suggest all the features recited in the rejected claims and one of ordinary skill in the art would not have combined the teachings of Kalker and Haitsma in the manner speculated by the Office Action.

PRIOR ART FAILS TO TEACH OR SUGGEST ALL CLAIMED FEATURES

For example, the cited prior art fails to teach or suggest the claimed invention wherein a watermark is represented by a sequence of watermark samples each having a first or a second value, an image is divided into at least a first and a second image area, a global property of the first and the second image area is determined, and the image is modified to:

- increase the global property of the first area and decrease the global property of the second area for embedding the first value of a watermark sample into the image, or

- decrease the global property of the first area and increase the global property of the second area for embedding the second value of the watermark sample into the image.

Kalker merely discloses modulation of a global property of a frame in a HDTV-video signal whereby a watermark is embedded by modulating the property of the sequence of frames by the watermark. Kalker discloses that this property can be luminance or a histogram or features derived therefrom, i.e., features from the image itself. Kalker's method of modulating image frames in a temporal sequence is performed in a global manner. As a result, Kalker's method is prone to "de-flicker" operations that are often used to remove flicker, which results from the different frame rates of cinema projection equipment and consumer camcorders; flicker can cause a watermark to become invisible or undetectable.

The Office Action asserted that Kalker teaches, at paragraphs [0008]-[0011], the claimed modification of an image to increase the global property of the first area and decrease the global

property of the second area for embedding the first value of a watermark sample into the image or vice versa. However that passage of the specification included in the Summary of the Invention merely teaches as follows:

> [0008] To this end, the method according to the invention comprises the steps of determining, for each image, a global property of the pixels constituting said image, and modifying the global property of each image of a sequence of images in accordance with the corresponding watermark sample. In a preferred embodiment, said global property is the mean luminance of an image.
>
> [0009] It is achieved with the invention that the sequence of watermark samples constituting the watermark is distributed in a corresponding sequence of images, one watermark sample being embedded per image. The method thus embeds the watermark along the temporal axis and is therefore inherently robust against all geometrical distortions.
>
> [0010] Since the Human Visual System is sensitive to flicker in low spatial frequencies, the watermarked signal may suffer from artifacts especially in non-moving flat areas. These artifacts can be significantly reduced, when the flicker frequency of the watermark is lowered, by embedding the same watermark sample in a fixed number of consecutive frames. Furthermore, it is proposed to use an adaptive scheme, where the change in luminance for a pixel depends on a local scaling factor, which is determined for every pixel. The local scaling factor should be large in moving textured areas and low in non-moving flat areas.
>
> [0011] The embedded watermark is detected by determining the global properties at the detection end, correlating a sequence of global properties with a sequence of reference watermark samples, and generating an output signal if the correlation value exceeds a predetermined threshold value.

Thus, clearly, Kalker makes no mention of dividing an image into a plurality of areas or modification of an image to increase the global property of the first area and decrease the global property of the second area for embedding the first value of a watermark sample into the image or vice versa.

The Office Action appears to be relying on Haitsma to remedy the deficiencies of Kalker. However, in Haitsma, watermark detection is performed by computing the correlation of a suspect information signal with an applied watermark pattern and comparing that correlation with a pre-determined threshold. If the correlation is larger than the threshold, the watermark is considered to be present, otherwise it is considered to be absent. Although, Haitsma subdivides a plurality of images into a plurality of tiles and modifies each tile by embedding the watermark in each tile and spatially shifting the tile over a vector (see, column 2, lines 47-59), there is no

teaching regarding the modification of an image to increase the global property of a first area and decrease the global property of a second area to embed the first value of a watermark sample into the image or vice versa.

To the contrary, in the claimed invention, an image, e.g., a frame, is subdivided into a first and second image area and a global property of the first and second image area is determined. The first and second image areas are then modulated by increasing the global property of its first area and decreasing the global property of the second area or vice versa. This is contrary to the teachings of Haitsma, which embeds a watermark based on a spatial shift of the subdivided area including the watermark rather than a global property of a subdivided area.

As explained in Applicant's specification, the global property relates to, for example, luminance or a histogram of pixel values; thus, one of ordinary skill in the art would recognize that Haitsma's use of a spatial shift actually teaches away from the inventive concept of the claimed invention. In fact, Haitsma's teachings regarding global depth parameter d (and its teachings in total) fail to provide the claimed division of an image into at least a first and a second image area, determination of a global property of the first and the second image area is determined, and modification of the image to increase the global property of the first area and decrease the global property of the second area for embedding the first value of a watermark sample into the image or vice versa.

Thus, the combined teachings of Kalker and Haitsma fail to teach or suggest all the features recited in the claimed invention, in particular, the modification of an image to increase the global property of a first area of the image and decrease the global property of a second area of the image to embed the first value of a watermark sample into the image (or vice versa). Accordingly, the Office Action has failed to establish a prima facie case of obviousness and the rejection is traversed.

INSUFFICIENT MOTIVATION TO COMBINE PRIOR ART REFERENCES

Moreover, one of ordinary skill in the art would not have combined the teachings of Kalker and Haitsma as asserted by the Office Action. The Office Action recognized that Kalker fails to teach or suggest division of an image of the motion image signal to at least a first and a second image area. However, the Office Action asserted that Haitsma remedies this deficiency by teaching the partitioning of accumulated frames into blocks by "folding." The Office Action

also identified various teachings of Haitsma related to determining the strength of the final watermark based on a global depth parameter d. The Office Action asserted that it would have been obvious to one of ordinary skill in the art to divide the motion signal to upper and lower halves "to achieve sufficient robustness and increase in copy protection."

However, one of ordinary skill in the art would have recognized that Kalker uses a global property relating to pixel values whereas Haitsma relates to encoding a watermark using spatial properties of an image including the watermark. Therefore, one of ordinary skill in the art would not have looked to Haitsma to improve the robustness and copy protection offered by Kalker.

In fact, even if the teachings of Kalker and Haitsma were combined, the result would merely provide a solution wherein a watermark would be embedded temporally and spatially, and the temporally embedded watermark would be lost during de-flicker operations. As a result, the combined teachings of Kalker and Haitsma would not provide improved robustness and copy protection as hypothesized by the Office Action. Accordingly, the identified motivation to combine the prior art references is insufficient to support a non-obviousness rejection; as a result, the Office Action has failed to establish a prima facie case of obviousness and the rejection is traversed.

For all of the above reasons, withdrawal of the rejection of pending claims is respectfully requested. In view of the above, it is submitted that all of the pending claims are in condition for allowance and such action is respectfully requested.

If there is any issue remaining to be resolved, the examiner is invited to telephone the undersigned at (202) 371-6371 so that resolution can be promptly effected.

It is requested that, if necessary to effect a timely response, this paper be considered a Petition for an Extension of Time sufficient to effect a timely response with the fee for such extensions and shortages in other fees, being charged, or any overpayment in fees being credited, to the Account of Barnes & Thornburg LLP, Deposit Account No. **02-1010** (48588-47163).

Respectfully submitted,

BARNES & THORNBURG LLP

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